

ON AN INEQUALITY ARISING IN FRACTIONAL
OSCILLATOR THEORY

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Abstract

The dynamics of a viscoelastic rod of the fractional derivative type with concentrated mass at its end, constitutes a problem of a fractional oscillator. In the study of the asymptotic behavior of solutions an inequality is needed which is of the type $\int_0^T D^\gamma u(t) u(t) dt \geq 0, u(0) = 0, 0 < \gamma < 1$, where $D^\gamma u(t)$ is the Riemann-Liouville γ -th derivative of $u(t)$. Here we prove this inequality with precise conditions on $u(t)$.

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